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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,942	12/13/2001	Bradley Paul Barber	37310-000178	1470
30595	7590	04/15/2004	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			ALANKO, ANITA KAREN	
P.O. BOX 8910			ART UNIT	PAPER NUMBER
RESTON, VA 20195			1765	

DATE MAILED: 04/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/017,942	<b>Applicant(s)</b> BARBER ET AL.	
	<b>Examiner</b> Anita K Alanko	<b>Art Unit</b> 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 3/23/04 appeal brief.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,5 and 7-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5 and 7 is/are rejected.
- 7) ☒ Claim(s) 8-12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)          |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: <u>0404</u>  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

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In view of the appeal brief filed on March 23, 2004, PROSECUTION IS HEREBY REOPENED. A new grounds of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

- (1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,
- (2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

### *Claim Objections*

Claims 8-12 are objected to because of the following informalities: in claim 8, last line, the term "the substrate surface" lacks explicit antecedent basis. A complete reading of the claim renders the term understandable in that the cap wafer is bonded to another substrate, which can only be the substrate that contains the electronic devices. This also breathes life and meaning into the preamble. Applicant could amend the preamble to cite - - packaging electronic devices on a substrate surface- - or amend the last line of claim 8 to include - - a substrate surface containing electronic devices - - to overcome this objection. Similar objections are raised in claim 9, last line ("the substrate") and claim 12 ("a wafer"). Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

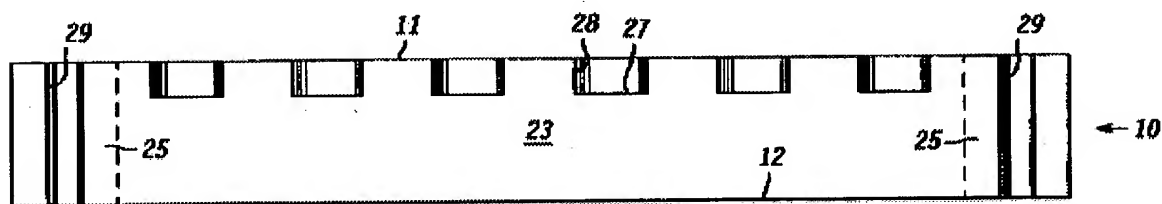
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Warfield (US 5,604,160).

Warfield discloses a method comprising:

providing a cap wafer 10 having a surface 11;

lithographically forming raised ridges 28 on the cap wafer surface at areas near a perimeter of a desired cavity region so that the raised ridges are a contiguous part of said cap wafer (Fig.6; col.2, line 20-col.col.3, line 30);

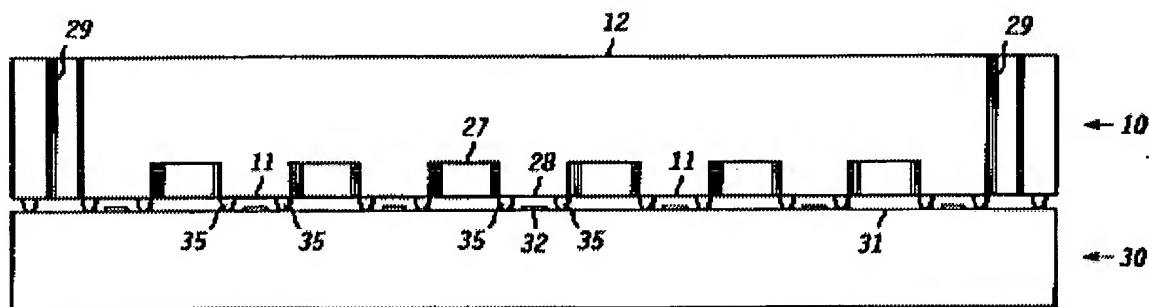


***FIG. 6***

printing a glass frit material 35 on the raised ridges (col.4, lines 1-6); and

bonding, via said glass frit material at each raised ridge, the cap wafer surface to a substrate surface 30 containing electronic devices (col.4, lines 11-33),

each raised ridge inherently using surface tension to hold the glass frit to a higher and thinner frit line width dimension, and to prevent lateral flow of the glass frit, than if the frit were deposited directly on a flat cap wafer surface without lithographically formed raised ridges.



**FIG. 7**

The preamble is given little patentable weight.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

*Claims 1, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurl et al (US 6,106,735) in view of Sasaki et al (US 2002/0017862 A1).*

Kurle discloses a method of packaging electronic devices, comprising the steps of:

- providing a cap wafer 3 having a surface (Fig.1A);
- forming raised ridges 4 on the cap wafer surface; and

- bonding (Fig. 1E), at each raised ridge, said cap wafer surface to a substrate surface 1 containing electronic devices 2.

As to amended claim 1, Kurle does not disclose how the ridges are formed. Sasaki teaches a useful method for forming ridges appropriate for printing glass frit and bonding. Sasaki teaches to lithographically form ridges by using resist 76 (Fig.4(a) – 4(e)). It would have been obvious to one with ordinary skill in the art to lithographically form ridges in the method of Kurle because Sasaki teaches that it is a useful technique for forming ridges.

Further as to amended claim 1, since the modified method of Kurle discloses the same method steps as the instant invention, the same results of higher and thinner frit linewidth dimension are expected.

As to claim 5, Kurle discloses a linewidth of 500 microns (col.3, line 26), not less than 125 microns. Sasaki teaches that the linewidth may be 40 microns (page 12, paragraph [0285]), which is less than 125 microns. It would have been obvious to one with ordinary skill in the art to form the linewidth to less than 125 microns in the modified method of Kurle because Sasaki teaches that dimensions on the same order of magnitude are useful for bonding two plates together with glass frit. It is further obvious to one with ordinary skill in the art to apply the smallest dimensions possible, such as those suggested by Sasaki, in order to increase the density of devices on a substrate, thereby increasing yield of the final product.

As to claim 7, Kurle discloses to form a hermetic seal (col.2, lines 39-41).

Claims 1, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Warfield (US 5,604,160) in view of Sparks et al (US 6,062,461).

The discussion of Warfield from above is repeated here. As to claim 5, Warfield does not disclose the linewidth of the glass frit. Spraks teaches that a linewidth of 100-200  $\mu\text{m}$  is required for glass frit bonding (col.6, lines 40-42). It would have been obvious to one with ordinary skill in the art to use a linewidth of less than 125  $\mu\text{m}$  in the method of Warfield because Sparks teaches that linewidths of this order of magnitude are required for glass frit bonding.

As to claim 7, Warfield discloses to form a continuous perimeter, so that a hermetic seal is formed (col.4, lines 20-33).

#### ***Allowable Subject Matter***

Claims 8-12 are allowable over the prior art.

#### ***Response to Appeal Brief***

The rejection of claims 8-12 is withdrawn. Applicant's remarks are persuasive in that Sasaki does not suggest to trench recesses into the cap wafer surface, as in the context of claim 8, rather a photoresist layer is developed which does not encompass trenching the cap wafer surface.

Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Warfield (US 5,604,160). Claims 1, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurle et al (US 6,106,735) in view of Sasaki et al (US 2002/0017862 A1), and over Warfield in view of Sparks.

***Response to Arguments***

To the extent that they still apply, applicant's arguments filed March 23, 2004 have been fully considered, but they are not persuasive.

Applicant argues that one would have to substantially alter the process in Kurle et al., eliminating the application of bonding frit strips 5 to web 4, since the frit strips would already have been applied. Examiner acknowledges that this is suggested by one embodiment of Sasaki. However, Sasaki discloses that alternatively to patterning a blanket layer of frit glass 75 (as in Figure 4), that the frit glass may be printed selectively on the raised ridges ([0208], [0247], [0296], [0298], [0300]).

In response to applicant's argument that Sasaki is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Sasaki is solving the problem not addressed in Kurle of how to form raised ridges and to bond with glass frit material.

Applicant argues that "because Sasaki teaches that it is a useful technique for forming ridges" is not sufficient motivation to combine. This is not persuasive. The primary reference is silent as to how the ridges are formed. Sasaki teaches one method, which is a useful method, for forming the ridges.

With respect to claim 5, applicant argues that Sasaki refers to a filler of linewidth 40  $\mu\text{m}$ . However, in a subsequent paragraph [0285], Sasaki refers to division walls that have a linewidth



of 40  $\mu\text{m}$ , which reads on the claim limitation. Both Kurle and Sasaki use screen printing to deposit the frit.

### *Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kurtz (US 5,891,751), Hwang et al (JP 2001-035396 A) are cited to show a method with glass frit bonding. Cohn et al (US 2002/0096421 A1) is cited to show linewidth during glass frit bonding ([0007]).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K Alanko whose telephone number is 571-272-1458. The examiner can normally be reached on Mon, Tues & Fri: 8:30 am-5 pm; Wed&Thurs: 10 am-2 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit: 1765

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*Anita K. Alanko*

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Primary Examiner  
Art Unit 1765

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SUPERVISORY PATENT EXAMINER

*Nadine G. Horton*